ABSTRACT:-

In any public transportation system, crowd management is a very big problem .As we live in Delhi, here DTC (Delhi Transport Corporation) manages the bus transportation system in Delhi. As we daily travel in DTC buses we also face it. Approx 4 million passengers daily travel in DTC in 6000 (estimated) buses . As a passenger we should know how many buses are on my route and where they are? How many passengers are already on a specific bus? Sometimes it happens that two buses one after one, one is crowded and another is vacant. If we know how many people are there and where is the bus so as a passenger we prefer to go that bus in which there are less passenger in comparison to another and sometimes it happens that passenger leaves a slightly loaded bus in expectation of that coming bus will be empty sometimes this happens and not many times .The motive of the project is to provide information to the passengers about number of buses running on specific route and how many passengers are there in the specific bus and where it is. If passengers know the correct timing of the bus then their time will not be wasted. To solve this problem we have created a R.T.P.C.S which tells how many passengers are there in the bus and all the data we send to the web server at a real time.

So the distribution of people in the DTC buses can be adjusted in a better way. In this project we have built a counter system which counts the number of passengers entering and exiting the bus in real time .

INTRODUCTION:-

Real time passenger counting system is a system through which we count the number of passengers and upload data to a website in real time through which every one can access.

APPARATUS:HARDWARE

PART:-

Arduino:-

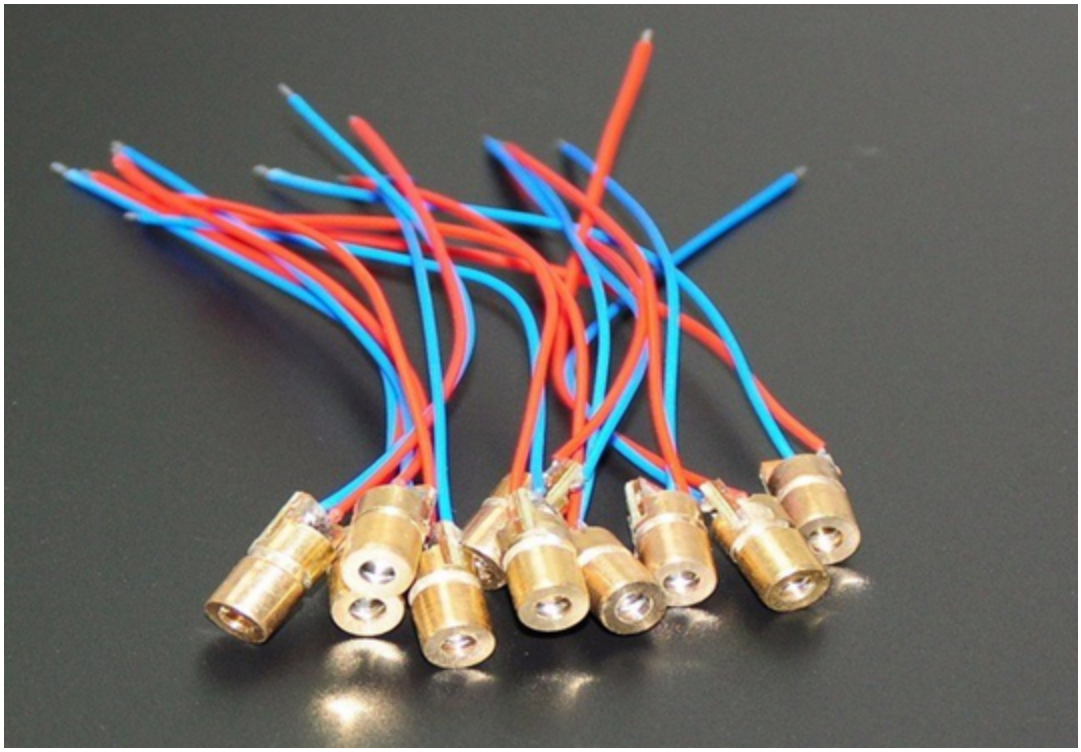
Arduino is an open-source electronics platform based on easy to use hardware and software. Arduino boards are able to read input - light on a sensor , finger on a button ,and turn it into an output – activating a motor ,turning on an LED,publishing something's online. The Arduino board is connected to a computer via USB ,where it connect with the Arduino development environment (IDE) the user writes the Arduino code in the IDE , then uploads it to be microcontroller which executes the code, interacting with input and outputs such as sensor motor and light.

Types of Arduino

Arduino uno
Mega arduino
Nano arduinoLilypad arduino
Red board arduino

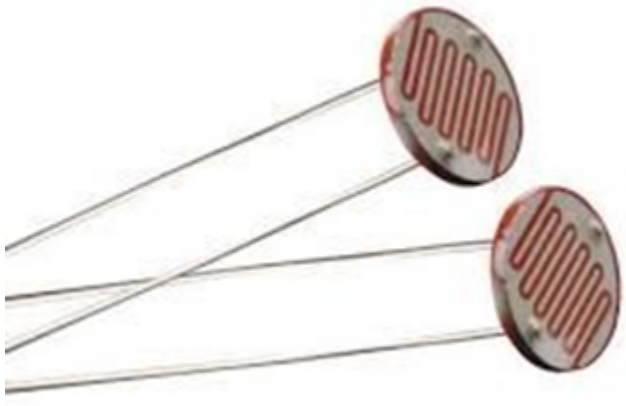
LASER(Light Amplification By Stimulated Emission of Radiation)-

A semiconductor device that generates coherent light of high intensity is known as Laser diode. Stimulated emission is the basis of working of a laser diode. Laser diodes are similar to LED, however, different from LED, the PN junction of laser diode produces coherent radiation.



LIGHT DEPENDENT RESISTOR:-

A Light Dependent Resistor (**LDR**) or a photoresistor is a device whose resistivity is a function of the incident electromagnetic radiation. Hence, they are light sensitive devices. They are also called photo conductors, photo conductive cells or simply photocells.



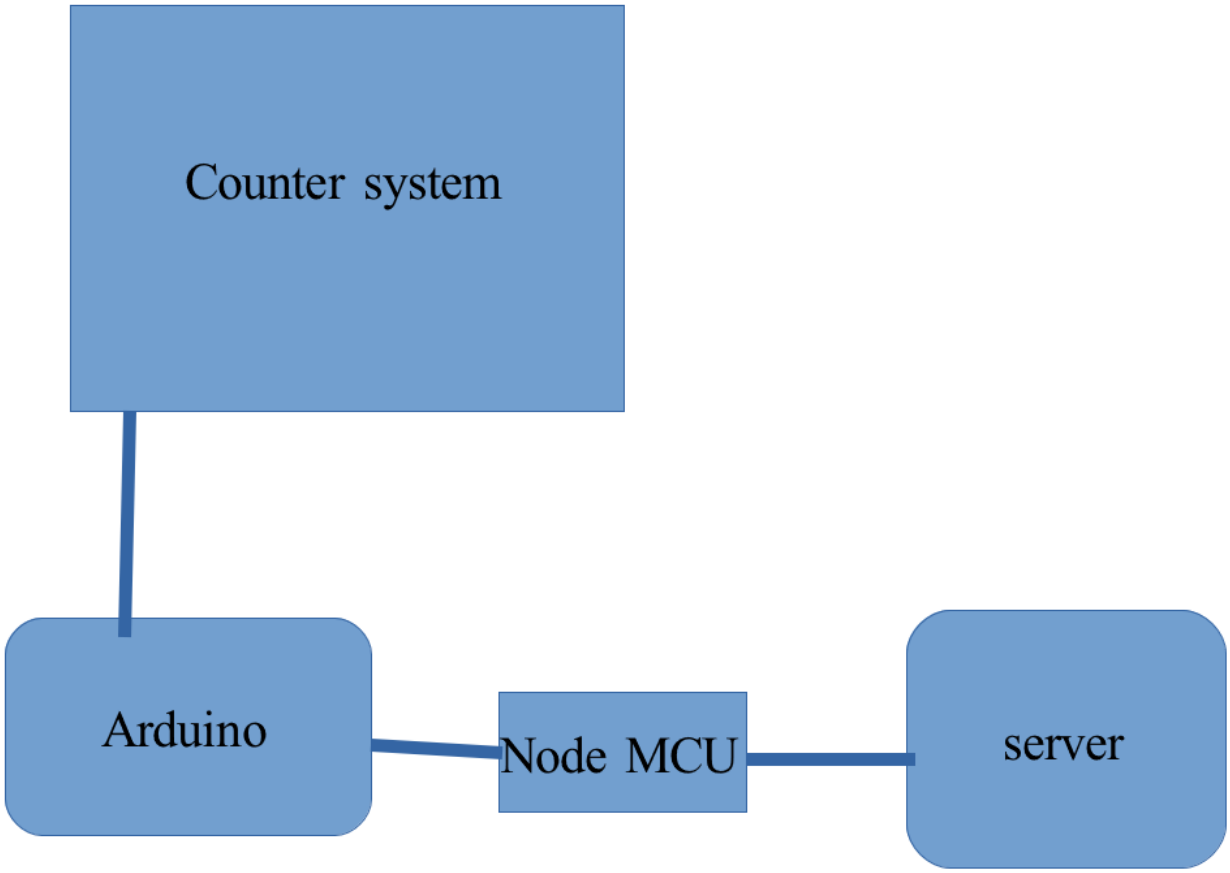
SOFTWARE PART:-

1. ARDUINO IDE:-

The Arduino integrated development environment **(IDE)** is a cross platform application (for Windows, MacOS, Linux) that is written in the programming language Java. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards.

The source code for the IDE is released under the GNU General public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the wiring project, which provides many common input and output procedures.

BLOCK DIAGRAM



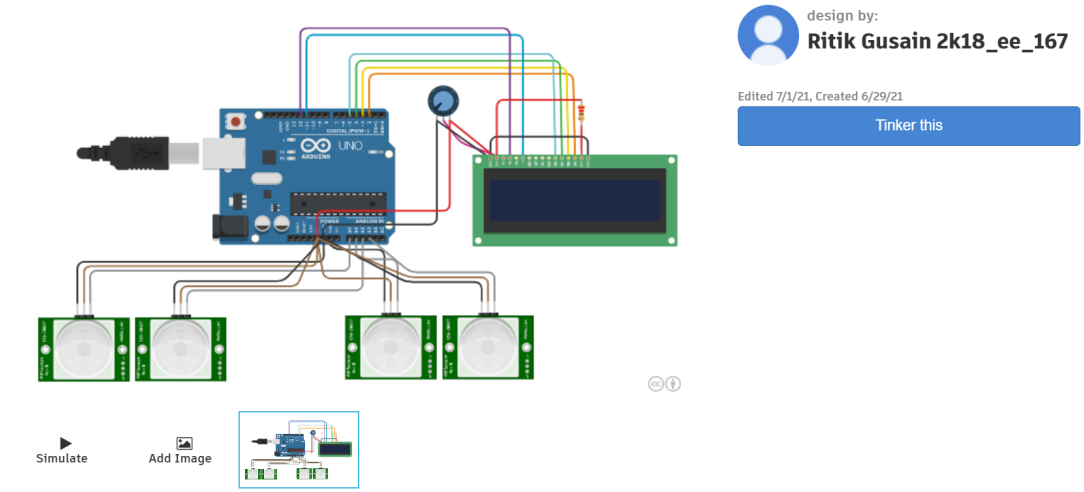
1. COUNTER SYSTEM :-

In this process we have made two gates. One gate for entry and another gate for exit. But they can also exit from the enter gate and enter from exit gate because the counting will also be correct with this process. In this system we have put up two lasers at one gate whose light is falling directly on LDR. If there is any moment between laser light falling on a direct LDR circuit count it like a person.

2. Arduino UNO:-

As I told you about the arduino in apparatus arduino is an open source hardware and software company, project and user community that designs and manufactures single board microcontrollers and microcontroller kits for building digital devices. The Arduino reads the analog value of LDR. Then we calculate the number of passengers .

Circuit diagram:-



[Click to see simulation]

ARDUINO CODE:-

```
#include
<LiquidCrystal.h>
```

These are the set of variables which we are using through out the program for computation

And counting the number of passengers . These variables are declare in arduino.
As counting is done by arduino uno.

```
int back0 = A1;
int back1 = A3;
int front0 = A0;
int front1 = A2;
int ppl = 0;
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
bool pi = 0;
bool po = 0;
bool pipr=0;
bool popr=0;
bool lo=0;
bool ro=0;
bool li=0;
bool ri=0;
```

Here we have initialized the parameters.

```
void setup() {
  pinMode(A1, INPUT);
  pinMode(A0, INPUT);
  pinMode(A2, INPUT);
  pinMode(A3, INPUT);
  lcd.begin(16, 2);
}
```

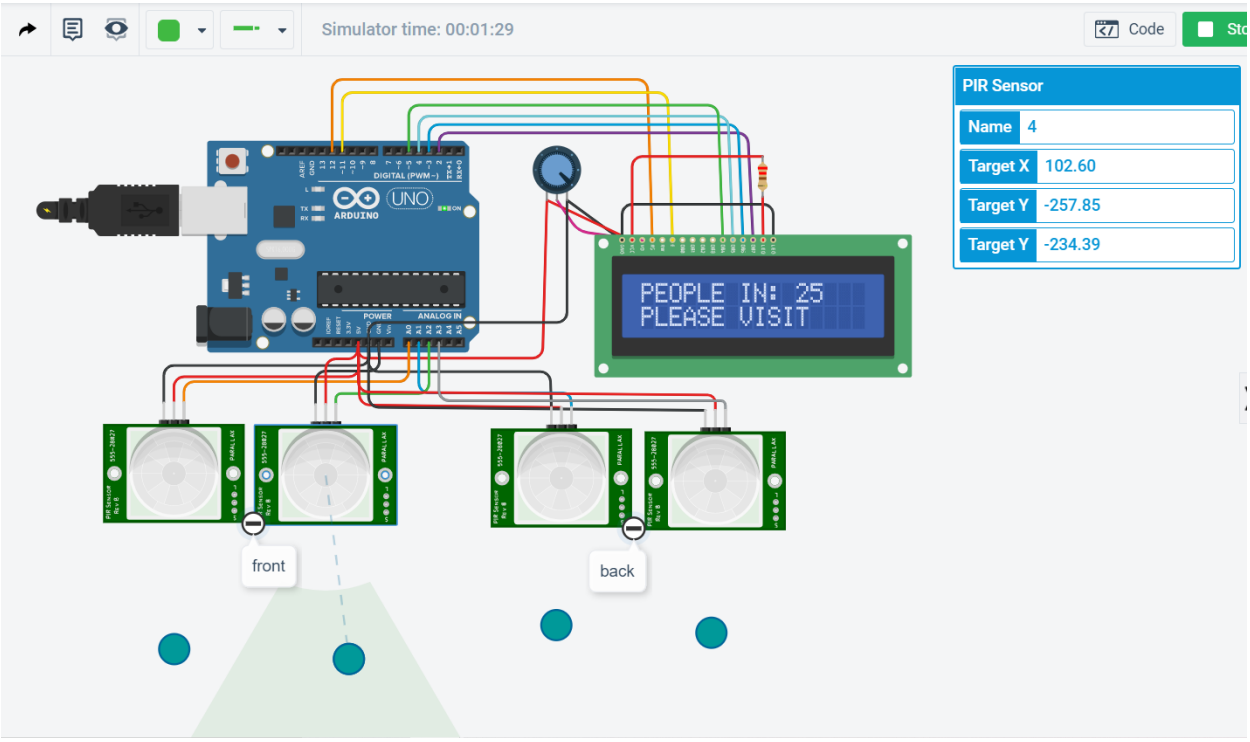
Above code is an algorithm to know whether a person is entering a bus or leaving the bus . It can only work when passengers enter one by one. If two passengers enter at the same time it counts as one entry . As buses have two gates, passengers can enter or exit from the gates. So we have applied the same algorithm to another gate .

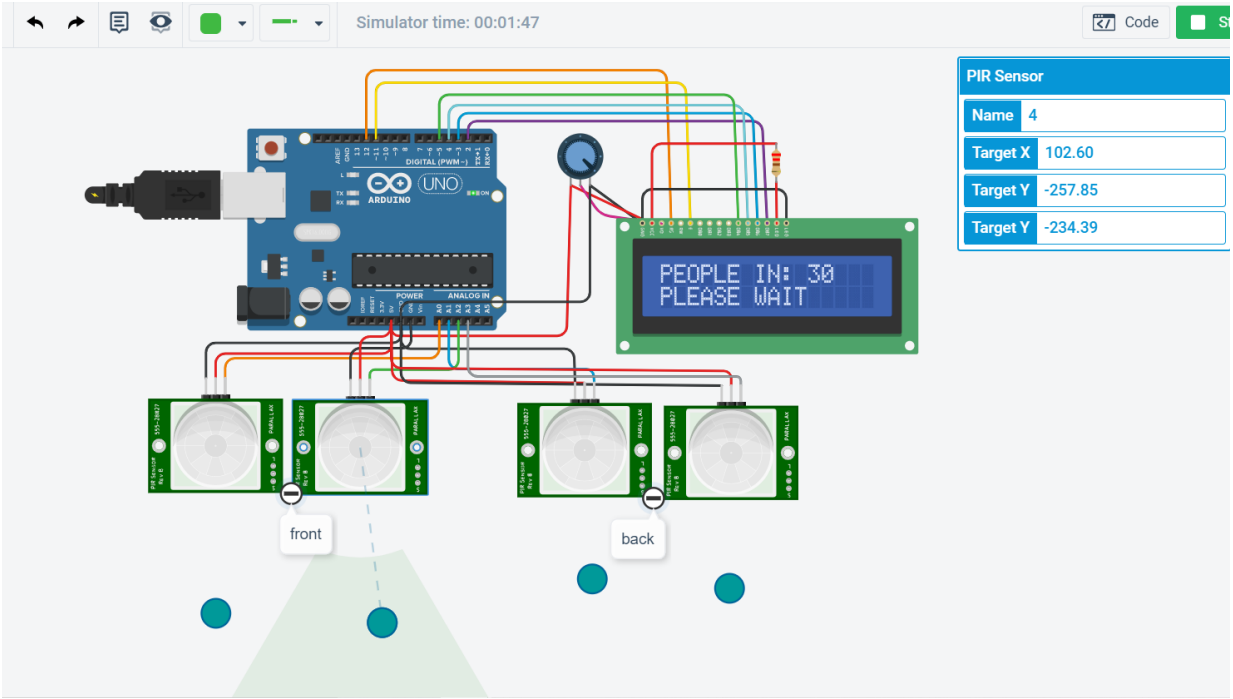
```
void loop() {
  lcd.clear();
  pi = digitalRead(back0);
  pipr = digitalRead(back1);
  po = digitalRead(front0);
  popr = digitalRead(front1);
  if (pi == 1){
    if(ri==1){
    ppl++;
    ri=0;
    }else
    li=1;
    delay(500);
  }
  else if (pipr == 1){
   if(li==1){
    ppl-- ;
     li=0;
   }else
   ri=1;
    delay(500);
  }
  else if (po == 1){
    if(ro==1){
    ppl-- ;
      ro=0;
    }else
      lo=1;
    delay(500);
  }
else if (popr == 1){
  if(lo==1){
    ppl++ ;
    lo=0;
  }else
    ro=1;
    delay(500);
```

```
  }
  ppl = constrain(ppl, 0, 50);
  lcd.setCursor(0, 0);
  lcd.print("PEOPLE IN:");
  lcd.setCursor(11, 0);
  lcd.print(ppl);
  if (ppl >= 30){
     lcd.setCursor(0, 1);
     lcd.print("PLEASE WAIT");
     delay(1000);
  }
  if (ppl <= 29){
     lcd.setCursor(0, 1);
     lcd.print("PLEASE VISIT");
     delay(1000);
  }
}
```

RESULT

The Prototype model of “R.T.P.C.S” has been successfully implemented.which count number of passenger entering or exiting in a bus





Future Improvement:-

In ELITE we have made only a counter system which counts the number of passengers in a bus. That we upload on our website server. We can improve the counter system further by following ways:-

1) Efficiency can be improved by using a better microcontroller. We suggest that WEMOS D1 or similar microcontroller is the best choice for our work.

We are not satisfied till the model is not complete for use. The following thing must be in R.T.P.C.S to apply in the real world. Following things are:-

1) Keypad through every time the conductor enters the bus number .

2) GPS module for tracking the bus location.

3) Android application OR website for users to access the service.

CONCLUSION:-

Today the world is full of technology. We can see and also use the advanced technology around us. Through this type of technology our lives become easy. We can save our valuable time and use it in doing any other important work. We can manage a crowd and also keep the valuable data for further reference.

If we know how many people are there and where is the bus so as a passenger we prefer to go that bus in which there are less passenger in comparison to another and sometimes it happens that passenger leaves a slightly loaded bus in expectation of that coming bus will be empty sometimes this happens and not many times .The motive of the project is to provide information to the passengers about number of buses running on specific route and how many passengers are there in the specific bus and where it is. If passengers know the correct timing of the bus then their time will not be wasted. To solve this problem we have created a R.T.P.C.S which tells how many passengers are there in the bus and all the data we send to the web server at a real time.

REFERENCES

1) https://www.arduino.cc/reference/en/

2) https://www.youtube.com/watch?v=I1iz0YlBl84&t=9s

3) https://www.youtube.com/watch?v=v1otHJGlV5g&list=PLEiPMJpUdbj6a2p9Pt6tBdJhcqmWgX7Oa

4) https://www.instructables.com/id/Using-an-LDR-Sensor-With-Arduino/

5) **Postman tool**

-THANK YOU <3